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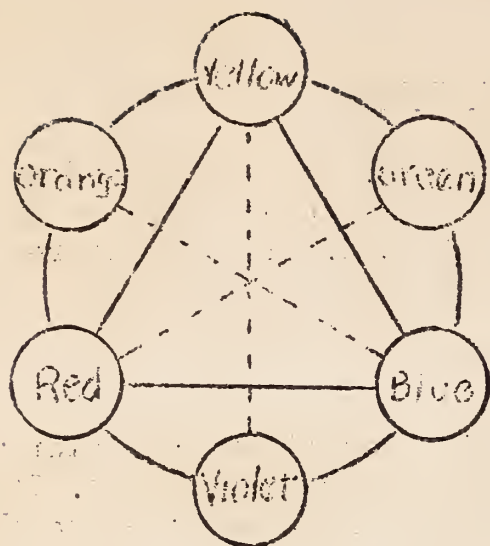
HOME DYEING WITH COMMERCIAL DYES

Many faded garments and household materials, the fabrics of which are still good, can be made usable by redyeing. Much expense can be saved by dyeing them at home. The process is not complicated, although it requires time and patience.

SELECTION OF THE COLOR

In selecting the color to use in redyeing, consider the color already on the fabric as well as the one desired for the dyed material. It is always easier to dye a fabric a deeper shade of the same color than to change to a new one. In case, however, a different color is desired, top dyeing or dyeing a new color over the old offers many possibilities. Often very interesting and satisfactory color combinations result. The following suggestions are given for dyeing one color over another.

1. Any color can be dyed a deeper shade but never a lighter one unless the original color is removed.
2. To redye material a different color or a deeper tone of the same one, the dye must be darker than the original color.
3. Light tints such as baby blue, flesh pink, eggshell, and pearl gray may be treated as white and dyed any color except a very faint tone.
4. Any color can be dyed black but instead of a dead black a tinge of the original color may result. Blue often gives a blue-black; green, a black with a greenish cast, while red or brown may give it a bronze tone.
5. Dark colors such as wine, deep purple, midnight blue, dark green, and brown can only be redyed the same color or black.
6. The brightness of the color on the fabric and the strength of the dye bath affect the resulting color. For example, an old-rose-colored material dyed in a weak bath of dark blue will be a light reddish purple, but when dyed in a strong bath of blue it will be a more decided purple with perhaps a bluish tinge.
7. Closely related colors can be dyed the same color. All yellows, oranges, and yellowish reds take a brown and all greens including those with a yellow or blue cast can be dyed dark green.
8. Complementary colors (see diagram, page 2) tend to gray or neutralize each other. They are used to advantage in producing soft, unusual colors that can be obtained in no other way. A red dyed over green produces a gray which may have either a red or green tinge, depending on whether the stronger color is on the fabric or in the dye bath. Sometimes black and gray are used to subdue colors but these produce dull, muddy tones instead of soft, interesting ones.



A color wheel

The primary colors are red, yellow, and blue. All other colors are made from them.

The secondary colors are orange, green, and violet. They are made by combining two primaries. Yellow and blue give green; blue and red produce violet; red and yellow make orange.

Complementary colors are those opposite each other in the color wheel, such as red and green, yellow and purple, and blue and orange. One primary and one secondary color make each pair of complements.

9. Combining a primary and a secondary color gives an intermediate color. For example, mixing orange with red makes a red-orange. Putting yellow and green together produces a yellow-green.

10. Beige, sand, mouse, fawn, and the lighter grays can be dyed any medium or dark shade but the resulting color will be somewhat grayed for these are all neutralized tints of primary or secondary colors.

If a change of color is preferred and the effects of dyeing one color over another are not desired, the old color can be removed by a bleaching process known as stripping. (See Stripping the Color, page 5.) Then, any color can be chosen and no thought need be given to the way the original color affects the dye. If done carefully, stripping will not injure the fabric.

SELECTION OF THE DYE

There are many kinds of fabric dyes on the market. The one to be used must be selected not for its color alone but according to its reaction towards textile fibers and its chemical nature and fastness.

ACTION OF DYES ON TEXTILE FIBERS

In general, the animal fibers such as wool and silk combine more readily with dyes than do cotton, linen, and other vegetable fibers. Wool combines the most readily with practically all kinds of dyes. It probably forms a chemical combination with them. Silk, which is chemically similar to wool, reacts much the same way.

Cotton is almost pure cellulose and therefore has little affinity for dyes. In the industry fast colors are produced on cotton by complicated processes requiring expensive equipment, impossible to duplicate at home. The homemaker will always have trouble with home-dyed cottons fading and crocking. Linen and other vegetable fibers are dyed in much the same ways as cotton.

It is not advisable to redye weighted silks since they are apt to dye unevenly due to the decomposition of the weighting. They often weaken and may even go to pieces in the dye bath. A simple test for weighted silk is the burning test. Pure silk will burn readily with a small flame, leaving a round ball of crisp, black residue, but weighted silk ignites with no flame and the outline of the yarn or fabric shows plainly in the ash.

Also, garments and fabrics badly streaked and faded by sunshine cannot be redyed successfully. Sunburn changes the character of the fibers. They are burned and scorched as if with a hot iron and although the change appears slight, the burned part will dye a much deeper shade. To get an even color such material must, therefore, be dyed a dark color or black.

CHEMICAL NATURE OF DYES Since textile fibers are different chemically, they require dyes of various types. Nearly all dyestuffs can be divided into six classes: vat, sulphur, mordant, basic, acid, and substantive or direct dyes.

The vat dyes get their name from the fact that the dye, a reducing agent to change the dye, and an alkali to dissolve it so that the fiber can take it up, are all combined in a vat. The fabric is dipped in this dye bath then exposed to the air a few minutes, and the process repeated until the desired color is developed. The air acts on the dye and fixes the color firmly in the fiber. Indigo is the most important vat dye. These dyes are used mostly on cotton, to some extent on wool, and are very fast to light and washing.

Sulphur dyes are used with alkalies or with sodium sulfide. Since these compounds damage wool and silk, sulphur dyes are applied chiefly to cotton. They produce deep, heavy shades that are fast to washing.

Mordant dyes require a special chemical, known as a mordant, for holding the color. The fabric is first soaked in a solution of the mordant, which is usually a compound of iron, chromium, aluminum, tin, or copper, and the dyestuff then combines with it to form a fast color. The same dye often gives very different colors with different mordants. These dyes are mostly applied to wool. Logwood used with an iron mordant produces a good black on silk. By a special process, cotton can be mordanted and is then dyed with basic and other dyes. Most of the vegetable dyes are mordant dyes.

The basic dyes are applied in a neutral or slightly acid bath. They are used chiefly for silk, although they dye wool directly and cotton on a tannin mordant. They produce brilliant and clear colors. As a class, the basic dyes are not so fast as the acid dyes and are less important for dyeing wool and silk. Most of the acid dyes require the addition of an acid in the dye bath and a few are used with common salt or with Glauber's salt. Acid dyes are fairly fast to light and washing, unless strong alkaline soaps or washing powders are used.

Substantive or direct dyes are applied directly to the fiber without a mordant. These dyes are used chiefly on cotton and linen, somewhat on silk and wool. Deep shades cannot be obtained and the color bleeds readily on washing.

Since the acid and direct dyes are the easiest to apply, the household package dyes which the homemaker buys for use in home dyeing belong to these two classes. Some are intended for cottons only, others just for silks and wool. Those spoken of as "all-fabric" dyes can be used for all fibers. Many of these are either direct cotton dyes or are mixtures of direct and acid dyes. Only the dye manufacturer knows what kinds of dyes the package contains and to what fibers and by what methods they should be applied. Therefore, to insure good results, all directions given on the package must be followed very carefully. Do not attempt to re-dye a cotton fabric if a very fast color is needed. Most direct cotton dyes fade badly.

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FASTNESS OF DYES The fastness of dyes differs widely even among the same class; some acid dyes are very fast while others are fugitive; the same is true in general of the basic and direct cotton dyes. The mordant dyes, taken as a class, are regarded as having the greatest fastness. Fastness is a relative term, for no color is absolutely fast to all agencies. It may be fast to one but not to another. For example, one dye may be faded by sunlight but be fast to washing or to perspiration. Also a dye may be fast when applied to one fiber but not to another; then, too, the dye may be fast with one method of dyeing but not fast with others.

Once a fabric is dyed nothing can be done to set the color or to make it fast to the several agencies affecting it. Soaking fabrics in weak vinegar or salt water has no effect on making dyed materials fast to washing.

OBTAINABLE FORMS OF DYES

Commercial household dyes can be purchased in powder, liquid, and cake form. The powdered dyes must be thoroughly dissolved and carefully strained through cloth before being added to the dye bath. Failure to do this may result in streaked and uneven dyeing. Liquid dyes are usually restricted to decorative purposes. The cake dyes are very convenient to use and when combined with soap help to cleanse the material as they color it.

Some dyes, intended for tinting rather than dyeing, are used in cold water and require no boiling. Although this kind of dyeing can be done in a short time, the color will not be fast and retinting must be done as often as the article is laundered. Permanency of color in dyeing is very desirable and in this respect the boiled-in dyes give better satisfaction.

CHEMICAL ASSISTANTS USED IN DYEING

The salt and acid used with dyes are not truly mordants but "assistants" since they merely aid the dyeing process rather than actually combine with the fiber and the dye. Common salt is added to clear or exhaust the dye bath. It causes the dye to leave the solution and go on to the material. In the process the goods is usually dyed for a short time with the color dissolved in hot water; then the material is lifted out and in order to deepen the shade salt is added, stirred until dissolved, and the material put back and boiled. The acid (usually vinegar) reacts with the dye to form a color acid which dyes the fiber more readily. It also prevents a hard water from affecting the solubility of the dye. Sodium sulphate, commonly called Glauber's salt, is often used with acid colors to slow down the action of the dyestuff so that the color goes on the fiber more slowly and more evenly.

THE DYEING PROCESS

PREPARATION OF MATERIAL To prepare garments for redyeing, remove all trimming, buttons, and buckles, and rip out hems, plaits, and linings so that the dye can penetrate evenly through the fabric. If the garment is to be remade, rip it up first and dye the pieces. Remove all spots and stains (see U. S. Dept. Agr. Farmers' Bul. 1474, "Stain removal from fabrics: home methods") and wash the material well in soap and water. Rinse thoroughly. Any soap left in the fabric causes difficulty in dyeing. Faded garments should have their color levelled (see Stripping the Color, page 5.)

STRIPPING THE COLOR The process of removing color from a fabric is called stripping. This is often necessary if a new color is to be introduced in redyeing, especially if a lighter shade or tone. Then, too, the color should be leveled or removed from fabrics that are unevenly faded or streaked. On such fabrics where the dye alone has been affected and the fibers are not weakened or injured (see Action of Dyes on Textile Fibers, page 2), fading is not serious. However, leveling the color will make for more even dyeing.

Stripping may be done by boiling in several soap solutions of soft water and good neutral soap. Different color removers are often used. Javelle water and hydrogen peroxide (see U. S. Dept. Agr. Farmers' Bul. 1474, "Stain removal from fabrics; home methods," pages 4 and 5) will remove some dyes, but Javelle water weakens silk and wool and must not be used on them. Many bleaches and dye stripping agents, sold on the market under various trade names, are also used for this purpose. Sodium hydrosulphite is often employed as a stripping agent.

In many cases colors can be leveled on streaked cotton fabrics by washing soda, and on silk and wool by ammonia. Fill an enamel or agate kettle with lukewarm soft water and to every gallon of water add two table-spoons of washing soda for cotton, and 1/2 to 3/4 cup of dilute ammonia water (the 10 per cent strength available at drug stores) for silk and wool. Be sure the washing soda is completely dissolved. If ammonia is used mix it thoroughly in the water. Immerse the garment to be dyed and raise the temperature of the bath slowly to the boiling point. Be sure there is enough water to completely cover the fabric. When the color has been reduced satisfactorily, rinse the garment thoroughly before dyeing. Of course, removing color or stripping is the opposite from dyeing. Therefore, the stripping bath must be changed as often as it becomes colored; otherwise there is danger of boiling the color back onto the material. One must remember, too, that wool will felt and mat if boiled hard for any length of time, or if placed directly from hot into cold water. Do not boil silk vigorously or for longer than 20 minutes.

THE DYE BATH The kettle for dyeing should be granite or agate ware, and must be large enough that the material to be dyed can be completely immersed and moved about freely. Plenty of water to cover the fabric is very important to insure good results. Soft water gives better penetration of the dye. Weigh the fabric before it is wet and determine the amount of dye needed according to its weight. Dissolve the dye thoroughly in a little hot water, strain through a cloth into the dye bath, and stir well. Sticks of smooth wood or glass towel rods are convenient for stirring.

TEMPERATURE FOR DYEING The proper temperature for dyeing depends on both the kind of dyestuff and the fibers. As a rule it is better to put fabrics in the dye bath at a low temperature and then raise it gradually as the directions on the dye package state. Wool combines better with dyes at temperatures near the boiling point but it will not stand hard boiling. Silk takes up dye rapidly and to insure even dyeing, the dye bath should have a temperature of about 140° to 160° F. Wool and silk must never be left in the dye bath longer than the time stated in the directions.

The direct cotton dyes give better penetration of color to cotton and linen in a boiling bath although at lower temperatures they absorb more dye. For this reason, when dyeing dark colors allow cotton and linen to remain in the cooling dye bath for 10 to 15 minutes after removing from the fire. Cotton and wool mixtures should also be left in the dye bath until it cools down or the cotton will be lighter in color than the wool.

Since many rayons are weaker when wet, they must be handled very carefully and the dye bath kept below boiling. Some rayons take the dye as readily as silk while others need special treatment.

MANIPULATION OF MATERIAL Wet the material thoroughly, then quickly immerse in the dye, and keep in constant motion. All folds of the garment must be well opened out. It must be stirred and turned so that no part floats on top of the dye bath or remains at the bottom. Spotting and uneven dyeing result if the garment is allowed to float. On the dye package are directions for the manipulation of the material, the addition of salt or other chemicals, and the time required for boiling different fabrics. Follow all such directions implicitly.

RINSING Rinse the dyed material in several warm waters until the rinse water is clear, and finally in cool water. Use large quantities of water and, if possible, rinse in running water. Thorough rinsing to remove all excess dye prevents crocking. Wool materials must be rinsed in warm water and never placed directly from the hot dye bath into a cold rinse water. Sudden changes of temperatures will felt and shrink wool. Dye and rinse waters must be extracted evenly by squeezing and never by wringing or twisting.

DRYING AND PRESSING If convenient, it is well to hang the dyed garment out-of-doors in the shade and when partially dry, to lay it full length on a Turkish towel, fold the towel lengthwise over it and roll it up. When dry enough to iron, the material should be pressed under a cloth on the wrong side. If impossible to press on the wrong side, cover with a smooth heavy cloth and press on the right side but do not press until entirely dry or the fabric will have a shiny finish.

BOOKS ON DYEING

1. Horsfall, R. S. and Lawrie, L. G. The dyeing of textile fibres. 415 p., London, Ernest Benn Limited, Bouverie House. 1927.
A comprehensive textbook on commercial application of dyestuffs.
2. Matthews, J. M. Application of dyestuffs to textiles, paper, leather, and other materials. 768 p., illus. New York, John Wiley & Sons Inc. 1920.
Dyes and their application are discussed from a technical standpoint.
3. Phillips, M. J. Modern home dyeing. 46 p., illus. Mount Vernon, N. Y., North American Dye Corporation. 1922.
A pamphlet for homemakers on the use of commercial dyes.
4. Woolman, M. S. and McGowan, E. B. Textiles: A handbook for the student and the consumer. 572 p., illus. New York, The MacMillan Co. 1926.
A practical discussion is found in the chapter, "Dyes and dyeing."